

Malaria

Agent(s): Four different species of protozoan parasites: *Plasmodium falciparum*, *Plasmodium vivax*, *Plasmodium ovale*, and *Plasmodium malariae*

Mode of Transmission: Transmission through the bite of an infected female *Anopheles* mosquito. Transmission might also occur from infected mother to child during pregnancy or delivery, by blood product transfusion or through transplanted organs from infected donors. Humans and certain *Anopheles* mosquito species are the only natural reservoirs for malaria.

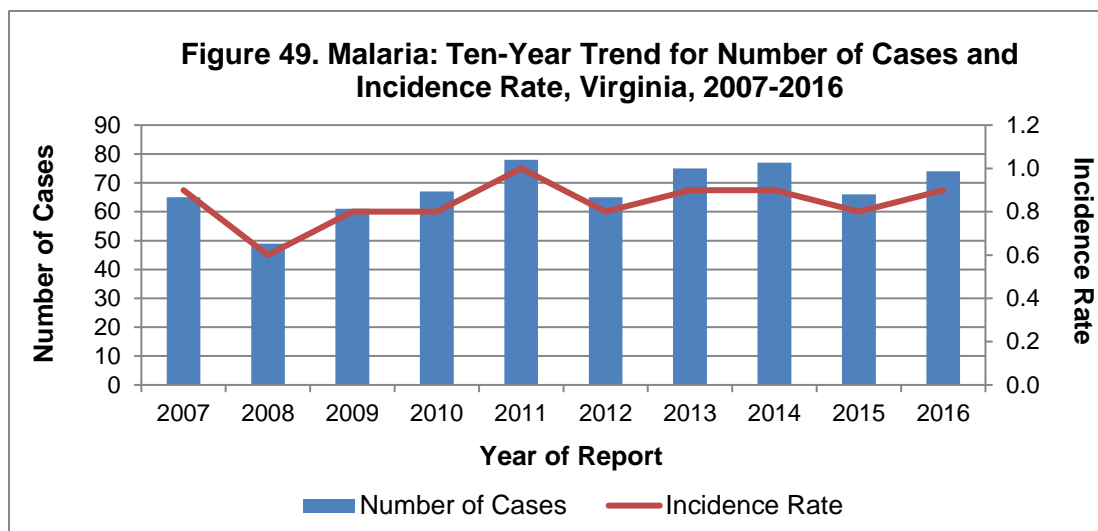
Signs/Symptoms: Typically, high fever, chills, sweats, severe headache, muscle and joint pain, anorexia, nausea, flu-like illness, anemia and an enlarged spleen. *P. falciparum* infections may progress to severe malaria if not treated promptly; symptoms include acute alteration of brain structure and function (i.e., cerebral malaria), severe anemia, jaundice, renal failure and coma.

Prevention: Appropriate medication for malaria prophylaxis should be taken by travelers when traveling to malaria-endemic countries. *Anopheles* mosquitoes bite only at dusk, dawn or during night-time hours and tend to enter buildings. Control measures include staying in structures with adequate screening and bed nets, and when outdoors, wearing long-sleeved, loose-fitting, light-colored clothing and mosquito repellents.

Other Important Information: Almost all infections reported in Virginia occur in persons who were infected in other countries. Although malaria is not endemic to Virginia, it may be brought to this region by travelers or immigrants with dormant or inapparent infections. Malaria might also arrive in Virginia with infected mosquitoes transported in aircraft or ships arriving from foreign destinations. Two potential mosquito vectors for malaria are present in Virginia: *Anopheles quadrimaculatus* and *An. punctipennis*.

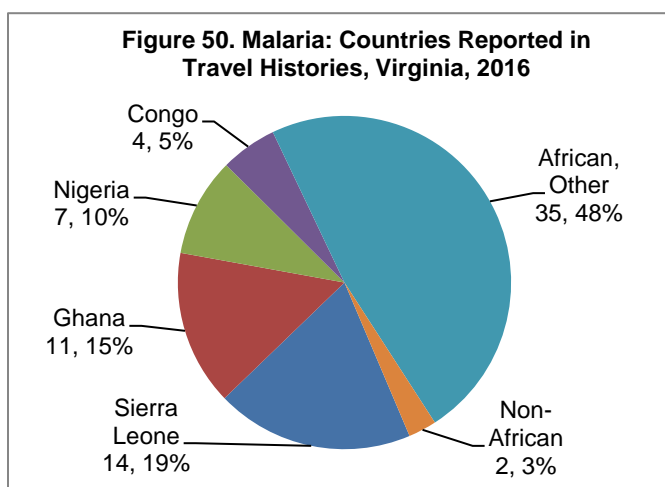
Malaria: 2016 Data Summary	
Number of Cases:	74
5-Year Average Number of Cases:	72.2
% Change from 5-Year Average:	+2%
Incidence Rate per 100,000:	0.9

In 2016, 74 cases of malaria were reported in Virginia. This represents a 12% increase from the 66 cases reported in 2015, and a 2% increase from the five-year average of 72.2 cases per year (Figure 49). Incidence rates were highest in the 30-39 year age group (1.9 per 100,000), followed by the 50-59 year age group (1.4 per 100,000 each). Incidence among the remaining age groups ranged from 0.4 to 0.8 per 100,000, with no cases occurring in infants. Race information was not reported for 20% of cases. For those with a known race, the incidence rate in the black population (3.1 per 100,000) was noticeably higher than the “other” race population (0.2 per 100,000) and the white population (0.1 per 100,000). Incidence among males was higher than females (1.1 and 0.7 per 100,000, respectively).



The majority (77%) of cases and the highest incidence rate (2.3 per 100,000) were both reported from the northern region, where the rate was more than double the statewide rate of 0.9 per 100,000. Rates from the remaining regions ranged from 0.2 to 0.5 per 100,000. No cases were reported from the southwest region. Incidence by locality can be viewed in the map below. Cases occurred throughout the year, with 35% being reported during the third quarter. Malaria almost always occurs among U.S. travelers returning from malaria-endemic countries, as well as among foreign visitors and immigrants from malaria-endemic countries; therefore, any observed temporal patterns are related to patterns of travel to and from endemic countries.

During 2016, 73 of 74 cases had a known travel history outside the U.S. in the two years prior to symptom onset. One case had an unknown travel history. Among those with travel outside the U.S., 97% reported travel to Africa and 3% reported travel to a non-African country. The distribution of specific countries reported as part of travel history can be seen in Figure 50.



The parasitic species of *Plasmodium* was identified in 60 of 74 cases. Of these 60 cases, 90% were *P. falciparum*, 3% *P. ovale*, 2% *P. vivax*, and 2% *P. malariae*. Two cases (3%) were infected with more than one malaria species.

Information on malaria prophylaxis usage was obtained for 62 of 74 cases. Of these 62 cases, 31% reported receiving prophylaxis for malaria. Among those receiving prophylaxis, 47% reported missing at least one dose. One malaria death was reported in 2016 and was attributed to cerebral malaria.

Malaria Incidence Rate by Locality Virginia, 2016

